

REMARKS

Claims 1-23 are pending. By this Amendment, claims 1-23 are amended.

Claims 1-23 have been amended to conform to standard U.S. practice. No new matter has been added and no narrowing amendments are intended.

Claim 18 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the term “LDL<sup>b</sup>” is not defined in the claim. This rejection is respectfully traversed. As stated in the application at page 9, lines 16-18, LDL<sup>t</sup> is a decomposition technique known in technical language, i.e. it is a mathematical term of art. References in a Supplemental Information Disclosure Statement submitted herewith include use of the term “LDL<sup>t</sup>.” It is therefore respectfully submitted that the term “LDL<sup>t</sup> profile technique” recited in claim 18 is a term generally known to those skilled in the mathematics arts.

Claims 1-6, 9, 10, 12-14, and 16-18 were rejected under 35 U.S.C. § 102(a) as being anticipated by Szeliski in “Motion Estimation with Quadtree Splines,” *IEEE Transactions On Pattern Analysis and Machine Intelligence*, Vol. 18, No. 12, Dec. 1996. Claims 19-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Szeliski in view of Moulin in “Application of a Multiresolution Optical-Flow-Based Method for Motion Estimation to Video Coding,” *IEEE*, May 1993. Claims 7, 8, 11, and 15 were objected to as being dependent upon a rejected base claim but allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The various rejections to claims 1-6, 9, 10, 12-14, and 16-23 are respectfully traversed.

Szeliski discloses a motion estimation method in which an image is cut into quadrangles according to a quadtree approach. In order to determine the motion field, Szeliski’s method uses the Levenberg-Marquardt algorithm for the differential optimization. In Szeliski, however, the differential optimization is not done for all the values of the motion vectors of the model; only new nodes are submitted to a differential optimization, wherein these nodes appear

when the meshing is refined. Moreover, the quadtree meshing approach is incompatible with a differential optimization for all of the nodes.

Further, the local refinement of the meshing is not done according to a criteria depending on the gaps  $E$  between the predicted image  $\hat{I}_2$  and image  $I_2$  in Szeliski. The local refinement is instead done according to a criteria depending on a residual flow. Refer to § 6.1, second indentation.

Szeliski thus does not teach or suggest globally optimizing the values of all the movement vectors of the model according to a differential method, as recited in claim 1 in cooperation with the other claimed elements.

Claim 1 was not rejected under 35 U.S.C. § 103(a). Moreover, Moulin does not teach or suggest the method for estimating movement between two numerical images of claim 1. Because the references of record do not teach or suggest the method of claim 1, claim 1 is allowable. Claims 2-23 depend from claim 1 and are allowable at least for this reason. The rejections to these claims are traversed but not expressly argued in view of the allowability of the underlying base claim.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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